A Work Project, presented as part of the requirements for the Award of a Master Degree in Management from the NOVA – School of Business and Economics.

Change Management at small and medium-sized enterprises:
Developing an agile and self-learning business by applying the philosophy of lean exemplified through the practical example of a German medium-sized engineering company.

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Wednesday, the 3rd of January, 2018

Abstract

The following work project provides insight into change management with the special focus on small-and medium sized enterprises. Businesses are always being forced to adapt to change, they must ensure measures are in place to effectively respond to these changes and be able to quickly implement solutions. The paper suggests and explains the philosophy of lean management as an enabler for an organization's change readiness. Lean management is considered an effective way in order to become a quickly evolved, agile and self-learning organization. The work project elaborates critical success factors for introducing change and lean management. A practical example of a German medium-sized engineering company, at which the author was employed, is used to exemplify the introduction of a company-wide change process as well as the implementation of lean management. The change at the company is also discussed critically as well as an overall conclusion about change management is drawn.

Keywords:

change management, lean management, agile organization, self-learning organization, family business, small and medium-sized enterprise

Table of content

Research methodology and literature review

A combination of research methodology approaches has been employed in this paper. This comprises academic literature review dealing with the topics of change management and lean management in particular at small and medium-sized enterprises (thereafter SMEs), an expert interview about key challenges and critical success factors of lean implementation at SMEs as well as the practical application of change and lean management at a German medium-sized engineering company.

1. Introduction to change management

Almost everyone is talking about change since the world is moving us closer together. Boundaries disappear, cultures converge and at the same time the overall complexity increases. Hence, companies are faced with these challenges and need to be flexible and adaptive to change in order to be successful and profitable in the long run. Whereas, in the past change management was considered as the adapting reaction to a situation that altered, today change is omni-present where businesses need to adapt to upcoming and often unforeseen situations rapidly and at any time. Not uncommonly, businesses also have to proactive shape the transition by themselves. All this brings to the point, that companies need to evolve to an all-time self-learning and agile system where uncertainties, improvements and adjustments are permanent conditions.

1.1. Definition of change management

Even if change management is widely used, it is a complex phenomenon missing a clear definition and rigid boundaries. Hence, the term change management does not have a universal definition. Some scientists classify change in two categories: micro (task level) and macro (strategic level) change management (Kang, 2015). Others in planned and unplanned change. Although, this made truly sense in the less complex past, this does not seem appropriate anymore as the boundaries between predictable and unforeseen change become increasingly blurred while the overall complexity of change increases. Niermayer and Postall (2013) define

change management as the action of companies to increase the economic performance and to strive for competitive advantage. A more comprehensive definition comes from Burnes (2009) who considers change management as transforming an organization from a present to a desired future state and subsumes all measures and activities that initiate and execute changes in structures, strategies, processes and behavioral patterns. The central interest is to generate acceptance, understanding, willingness and readiness for change within the entire organization.

1.2. Importance and drivers of change management

According to Luecke (2003), the state of continuous change has become routine and the pace of change has increased dramatically. Organizational change evolved to a continuous process (Burnes, 2004). Dynamism in emerging markets, technological disruption[1], enhanced connectivity[2] and the aging population are important forces at work (Dobbs et al., 2014). According to a study of Staufen AG (2017), the technological progress including digitalization and individualization of products and services are considered as the predominant drivers and challenges of change. Additionally, social networking, environmental consciousness, the new generations' changing lifestyle patterns in their behavior and beliefs as well as the growth of new economic and global forces like India and China, are further drivers for change. All these multi-dimensional causes intensify the need for continuous change and make it imperative. Even though 45% of organizations feel worried about these mega trends (Staufen AG, 2017), change management is never a choice but rather a necessity. In order to successful exploit change situations, it is essential to first clearly understand the circumstances surrounding a situation, secondly understanding the interactions and last but not least their impact to the company (Paton & McCalman, 2008).

1.3. Traditional models of change management in a rigid world

For a number of years in the past, the environment tended to change incrementally and slowly and organizations co-evolved with these changes accordingly. Usually, after a longer phase of

[1] Most recently the emergence of 3D-printing
[2] Most recently the emergence of smart glasses

stability and certainty a radical change appeared periodically and lead to large improvements. The uncertainty and the critical phase of adoption was narrowed down to the point where the radical change occurred and companies had to adjust to the new environment. Changes in the past were characterized as having clear beginnings and endings, were focused mostly on particular organizational topics and were often initiated by executives. When a change occurred, it was much easier to prepare one's self to it and be reactive ahead of time. To meet the challenges of those changes, organizations typically made use of effective but also rigid traditional implementation models such as the *Three-Step-Model* established by Kurt Lewin (1951). Referring to appendix 1, he suggests a straightforward linear model dividing a change into three different phases: (I) the unfreezing-phase aims to prepare the organization for change and to create awareness for the need of change by shaking up prevailing habits and behaviors, (II) the changing- or moving-phase is the actual movement towards the desired future states using various mechanisms like new strategies, structures or behaviors and is followed by the (III) refreezing-phase where the desired future state becomes present and the new habits are integrated in the day-to-day business. This stabilizes the organization till the next change occurs (Lewin, 1951). Besides, John P. Kotter, one of the most-cited authors when it comes to change, introduced another linear model called the *Eight-Steps-to-Successful-Change* (Kotter and Cohen, 2002). He identified eight steps (see appendix 2), which also aims to increase the likelihood of a successful implementation of change. Further traditional models come from Bullock and Batten, Kolb and Frohman, Whetten and Cameron among others (see appendix 3). Although, they are considered as different and widely used traditional models, they all emphasize the key role of people in managing change processes, and, hence, can be mapped onto Lewin's three phases.

Even if the traditional, linear implementation theories comprise useful advice to guide organizations through phases of changes, it becomes evident that these models are hardly applicable in the increasingly chaotic, complex, disruptive, uncertain, dynamic and constantly changing business world. For instance, Pollack and Pollack (2014) found out that the use of

Kotter's eight phases is significantly more complex in practice and that the steps often times vary in speed and, therefore, overlap rather than follow a linear sequence of steps.

1.4. New models of change management in an agile world

In contrast to the interactions between phases of stability and incremental change in the past, nowadays, external triggered changes appear in a more transformational manner, meaning that changes are rarely separated from each other by phases of calm and stability. Instead, organizations jump from one fundamental change to another and need to incorporate new capabilities on a frequent basis. Companies which fail to steadily rethink and rebuild their competitive advantages are doomed to failure. The so frequently quoted 70 percent failure rate of changes (Sirkin et al., 2005) comes often from the fact that traditional change management models were applied to transformational changes. Consequently, as mentioned above, linear models as proposed by Kotter and Lewin are too simple and do not picture today's complexity. Businesses and their managers are faced with many facets and tough challenges of change that require an effective and prompt answer.

A novel change theory comes from Worley and Mohrman (2014) by developing the *Engage-and-Learn-Model*, which is not perceived as a typical clearly defined change management model, but rather a descriptive approach that allows a company to change itself continuously. The model includes the four dimensions *Awareness*, *Design*, *Tailor* and *Monitor*[3]. Also, Jacobsen-Kramer (2017) is of the opinion that traditional views such as "change can be managed and people altered" are not applicable in the new agile world. Rather, he considers today's agile organizations as alive and complex systems where participants act autonomously and contribute to a dynamic and steadily improving culture. The corporate culture needs to enable fast learning and adaptation since pace is an essential competitive advantage in the today's world. Furthermore, the role of leadership needs to be reconsidered. Self-organized teams with high self-motivation and autonomy are state of the art rather than creating hierarchical leadership roles and their inherent power (Jacobsen-Kramer, 2017). Since change

[3] Since the model has no relevance for understanding the paper, please see appendix 4 for further explanations

happens all the time, at different speeds, on all levels in an organization and, hence, includes everyone within an organization, it cannot be implemented solely through top management anymore. All people are asked to continuously contribute to change by figuring out in a coordinated way, how to enhance their own work and that of their business unit. Therefore, the change strategy needs to be sensitive to people and context rather than focus solely on hard facts and outcomes (Dawson, 1994). To come to a conclusion, change management is not only an improvement activity, but rather a steadily process of learning and adjusting of everyone.

2. Change Management at SMEs

SMEs play a key role in the world's economy as they count for more than 70% of the world's production (Moore and Manring, 2009) and representing 99% of European manufacturing businesses. The European Commission (2017) defines SMEs as businesses that employ fewer than 250 persons, have a turnover of maximum 50 million euro and a balance sheet not exceeding 43 million euro. Being the engine for employment, economic growth and lastly the overall wealth of the population, the sustainability of SMEs becomes vitally important. However, to maintain long-term sustainability and resilience, proposed by Ates and Bititci (2011, p. 5601) as "the capacity of an organization to survive, adapt and sustain the business in the face of turbulent changes", SMEs need to be able to give innovative responses in a dynamic environment through continuous change, adaption and improvement. Especially, high flexibility due to on-demand and just-in-time delivery, and quick responsiveness are key (Sheffi and Rice, 2005), especially for manufacturing SMEs.

2.1. Characteristics of SMEs that influence change management

The way how SMEs operate their business and how they adapt to changes differ from the way of large multinational companies (Sarkar et al., 2001). First, SMEs usually need to deal with limited resources in the sense of time, money and human (Van Gils, 2005). Due to that, introducing change typically brings a lot of workload to the company and ties up much of these scarce resources. Therefore, managers need to be aware of the effects and disorders on the current operating business. Besides resource constraints, changes in SMEs seem to be mostly

forced by pressure from the external environment (Hudson-Smith and Smith, 2007) rather than from self-awareness. This leads to the point, that managers of SMEs usually consider the surrounding of the company as given and react to it instead of leveraging internal capabilities proactively. Moreover, SMEs tend to think and plan short term, what makes them, on the one hand, quite flexible and agile, but on the other hand, more vulnerable to small changes and less able to deal with long-term developments (Laverty, 2004). Typically, SMEs lose themselves in focusing on solving day-to-day problems and firefighting actions, rather than prepare and execute an accurate strategic plan ahead of time. Additionally, strategic decisions are often made informal and are described as being implicit and reactive (Bergman et al., 2006). Furthermore, SME managers are often shareholders at the same time, so that they have both personal interest and investment in the company. Hence, a change strategy in SMEs is, in many times, closely linked and influenced by the actions, abilities and personality of the key people within the organization (Beaver and Prince, 2004). In order to figure out patterns of behavior to manage change in SMEs, Ates and Bititci (2011) conducted 232 interviews with senior managers of SMEs. The research shows, that change and culture management are often separated from each other. Culture management is mainly driven by rewarding employees and internal communication activities, whereas change management focuses on implementation issues. Moreover, planning and preparation fade into the background and hard, operational aspects are much more emphasized than soft aspects including organizational and people issues.

2.2. Key success factors for change management in SMEs

For many companies, change is still a problematic issue and studies show that two out of three change initiatives fail (Sirkin et al., 2005). Thus, how change is executed successfully in SMEs is still not that obvious and simple. Ates and Bititci (2011) point out that adapting to the uncertain future is a challenge for SMEs that requires resilience. The general definition of organizational resilience is the ability to anticipate key opportunities and events from emerging trends, constantly adapting and changing, rapidly bouncing back from disaster and remaining stable in a turbulent world (Marcos, 2008). Seville et al. (2006) take the view, that resilience of a company is often more closely related to softer, less tangible aspects such as the firm's vision,

culture and leadership style. But how can resilience of a SME be fostered? First, managers should delegate responsibility to their employees, so that they feel a certain degree of freedom in making decisions and have ownership in completing their tasks (Tompkins, 2007). Basically, the idea is that every employee becomes a change agent for his or her level and area. Additionally, according to Tompkins (2007), SMEs should step back from their solely reactive, primarily crisis-driven role of waiting until change is imposed to a proactive approach by creating a clear appealing and sustainable vision, a strong value system and an appropriate leadership style. What often times is overlooked is the force of resistance to change as one of the main causes for failure. Resistance means to protect and maintain the previous state by taking up a defensive attitude towards change. In the 1940s, Lewin first considered managing resistance in his model (Fiedler, 2010). It must be understood that proactive change is not only about indicating the rationale of change, but also that it is easy and persuasive communicable and all participants are able to follow (Bolton, 2004). Thereby, it is crucial that SMEs should include employees from different levels and functions as well as external shareholders including suppliers and customers (Tompkins, 2007). Lines et al. (2015) figured out that a day-to-day change project involvement of employees resulted in the lowest levels of resistance overall. Also, piloting a change on a small scale with observable quick-wins before expanding and rolling it out entirely helps reducing the barriers of change and enhancing the employee's willingness to participate. Further key success factors for change management in SMEs are identified by the research of Ates and Bititci (2011). They propose to place greater emphasis on soft aspects of change management like people, organization and culture and consider cultural and change management topics as interrelated rather than separated from each other. Moreover, SMEs should focus also on planning, preparing and embedding the phases of change instead of maintaining the focus only on operational aspects of change management. Taking a more strategic and long-term view of change is also important at SMEs. According to Lines et al. (2015), organizations with a long-term, multi-year and strategic view on change management face less resistance. Bel et al. (2017) consider communication as "a necessary precursor to change". However, the authors also express that communication needs the right

balance according to the size of the organization, the scope of the change as well as the number of people involved. Too much communication can also lead to resistance, disagreement and uncertainties. Besides, the engagement of employees, the preparation in leadership style as well as the prioritization of change projects are important (Lyke-Ho-Gland, 2017). A research conducted by Král and Králová (2016) identified four leading components of a successful change including strategy, process, people and culture and that changing any of these components lead to a change in the organizational structure. Last but not least, what really matters is not only worrying how to change but also what to change (Anand and Barsoux, 2017). Therefore, an objective and holistic picture of the organization's reality is the very starting point for change management in order to decide on what is needed to change.

3. The lean philosophy as an enabler for an organization's change readiness

The idea and philosophy behind lean is considered by many researchers including Daniel T. Jones (2016), one of the most-cited lean authors, as enabling organizations to act quickly and on site, which makes them, in turn, agile and self-learning. According to Jacobsen-Kramer (2017), lean management is for many organizations, especially for those with a strong concatenation of processes across different business units, a prerequisite towards agility. A study from Staufen AG (2017), conducted with more than 650 companies in Germany, shows, that the higher degree of lean implementation in an organization the higher the readiness for change (see appendix 5). All in all, there is no doubt among researchers that companies which introduce the concept of lean are able to respond much faster in the steadily changing world.

3.1. The concept of lean management

But what does lean stand for and what exactly is lean management? Lean management is not only a set of tools that increases efficiency, rather it is a management philosophy where a company strives for continuous improvement day after day. An organization which decides to operate their business alongside with lean principles, aims to be a self-learning, constantly improving system where everyone within the system participates, holds responsibility and has a certain degree of autonomy. Since lean is a culture and a way of thinking and acting

accordingly, it is not a cost reduction program that is finished once it is implemented. Instead, lean thinking is an everlasting approach that seeks to achieve small, incremental changes to improve the overall business and to adjust to the surrounding of the business (Jones, 2016). Furthermore, lean management focuses on the essential of the business, namely maximizing customer value while reducing waste (Lean Enterprise Institute, 2017). The concept identifies and removes seven types of waste within an organization[4]. Even if the origin of lean comes from increasing the efficiency and quality of manufacturing processes and is dated back to Toyota's production system in 1902, it is a misconception that it suits only for that. According to Sobek, Durward & Lang, (2010): "Lean is an approach to management that considers any resource expended that does not add value to the end customer to be waste." This fits for production but also for administration processes and, therefore, for any kind of business process. The traditional view on lean management was mainly focused on hard topics such as process optimization. However, in the increasingly complex world where innovation and improvements occur with a much higher pace, the human factor becomes even more vital. Besides other authors, Ballé (2016) points out that nowadays lean management is to a large degree a leadership topic. Hence, in response to the reality, the new perception on lean management includes the people orientation as equally important as the process orientation.

3.2. Two dimensions of today's lean philosophy: Process and leadership excellence

Today's point of view of lean transformation, characterized as moving from the old way of thinking towards lean thinking (Lean Enterprise Institute, 2017), considers that only the symbiosis of hard and soft aspects leads to a dynamic and steadily improving organization.

The pursuit for process excellence is based on four principles (Staufen AG, 2016): smooth, flow, rhythm and pull.[5] A key belief of today's lean concept is to build a self-learning environment that is able to accelerate dynamic improvements (Jones, 2016). Kadarova and Demecko (2016) emphasize that lean management requires strict discipline, needs leaders and leadership. Therefore, leaders play a crucial role in the philosophy of lean as they need to act

[4] For further information about the seven types of waste, see appendix 6
[5] For further information about the four principles of process excellence, see appendix 7

as mentors for their employees and constantly coach them in order to qualify them to execute improvements on a daily basis. According to the lean philosophy, leadership excellence tasks include forming small teams among their employees, supporting them in their idea generation by asking open questions, facilitate a self-learning and self-improving culture by empowering them and giving them autonomy and responsibility without letting them alone (Ballé, 2016; Jones, 2016; Staufen, 2016). Besides, lean leaders need to be open and able to learn also by themselves when claiming it from their employees. Hence, transparency through an established feedback culture is indispensable. In general, leadership excellence concentrates on spending more time with employees on the spot, what is called shop floor management since leaders act at the shop floor. This, by the way, also reduces employee's resistance to change. A basic requirement in executing lean leadership is a significant change in the organizational structure to the effect that the span of leadership has been reduced, meaning a decrease in the leader-to-employee ratio. This allows the leader to take care of and have time for every single employee. All in all, a lean leader is the person that brings together the process and leadership excellence and sustainably guides employees and the organization towards continuous improvement.

4. Establishing a successful lean culture at SMEs

In section 2.2 of this paper the author already points out several factors that are key for a successful change management at SMEs. Many of those are also applicable to establish a successful lean culture in SMEs – both summarized in appendix 8. However, to verify the key challenges and critical success factors for lean implementation within SMEs mentioned in the literature (Pingyu and Yu, 2010; Ulewicz and Kuceba, 2016), an interview with a lean expert was conducted. Herbert Schmidt (2017) is a former lean manager and has vast experience in the introduction of lean philosophy at a medium-sized logistics company in Germany. In his role as a lean manager, he was in charge of lean implementation at two locations, and, hence, Schmidt brings a practical viewpoint on critical aspects regarding a successful lean culture.

4.1. Key challenges of introducing lean management at SMEs

According to Schmidt (2017), one of the main challenges companies are faced with is

employees' fear. Since lean aims to optimize and to increase efficiency by eliminate waste, employees typically worry about losing their jobs. Skepticism and resistance towards lean characterizes their attitude. Besides, people within an organization usually do not see the need for lean initiatives and are reluctant to it. This effect even intensifies the longer an employee works for that particular company. Breaking the routine in their daily tasks, processes and habits is always hard and needs time. Moreover, as already learned, SMEs tend to think short-term, also in their HR planning, what often leads to a higher fluctuation. Consequently, it is much harder to implement lean thinking in the people's beliefs when they consider to work for the company only for a foreseeable period of time. But, Schmidt (2017) emphasizes that short-termism at SMEs also has negative effects on processes and financial goals. The rare use of formalized, methodical approaches as well as the lack of standardization are also barriers a SME needs to overcome when introducing lean management. Moreover, many SMEs are owner managed and an autocratic management style might cause serious owner involvement that could hinder an organization to establish a self-learning and self-improving culture. Last but not least, in many cases the key challenge firms need to overcome is the lack of understanding about the rationale and effects of lean. Many SMEs consider the implementation of lean as a project and draw the wrong conclusions, that it requires large financial investments only suitable for larger businesses.

4.2. Critical success factors of introducing lean management at SMEs

In the expert interview, Schmidt (2017) underlines 10 critical success factors that he figured out as equally important during his role as a lean manager at a SME.

1) **Have a clear understanding**

   It is crucial to have a clear understanding about the true beliefs, effects and requirements of the lean concept. Since the introduction of lean influences the entire management ideas and systems rather than being only a method or technique, management needs to be truly committed that lean is appropriate for the organization's culture and overall business. Defining clear and specific goals are also an important component for making the decision.

2) **Involve everyone**

Persons who are affected by the lean philosophy need to be involved from the very first day. For instance, at a process optimization, it is vital that the persons who do the job are involved in identifying improvements and defining the new processes. Besides, only by involving everyone in the problem-solving process, the organization moves towards self-learning.

3) **Establish a leader team**

Management has to define and establish a group of employees who have reputation, decision-making power, good knowledge, expertise in lean management as well as good interpersonal relationships among other employees. The aim of forming a leader team is to give them the responsibility to act as influencers and drivers for change. They need to be persistent, disciplined and good at motivating others.

4) **Train employees**

Besides the top management, it is equally important that employees have a clear understanding of the lean philosophy and its positive effects on the company performance. Train the participants is the best way to explain purposes and effects of realized actions. Schmidt (2017) suggests to conduct workshops that include theory and practical application. Participants first should get to know some theoretical background before applying it directly at their workplace through small changes. This illustrates how small improvements make the work easier and what impact it has on the outcome.

5) **Plan long-term and careful**

Many SMEs make the mistake to not carefully plan the lean implementation. However, a detailed and deliberate roadmap is vital - not only for the leader team who needs to carry the plan without losing employees' motivation and trust. Clearly defined steps, milestones and qualitative as well as quantitative goals are important parts of the plan.

6) **Start small and getting bigger**

When introducing lean management, it is relevant to figure out projects or departments that can serve as best practice examples. Through piloting, scarce resources like the leader team

can focus on constantly optimizing a few projects, before expanding lean on a larger scale. This also serves as reducing skepticism and increases employee's support.

7) **Networking and learning from others**

Building a network with other companies that practice lean principles enables the exchange of experiences, achievements and throwbacks and also helps to overcome own barriers. Schmidt (2017) highlights that exchange of best practices both among company locations and with other firms is key for an effective learning process where everyone learns from each other. Especially, firms that serve the same customers should bundle their lean knowledge and experiences to increase the customers' benefit.

8) **Define objectively measurable and specific criteria**

As already mentioned, clear and specific goals are important in understanding the lean philosophy as well as planning its introduction. However, a company needs a solid basis of transparency and accuracy in numbers such as quantities, times, costs and revenues. Only by having that, measurable and specific actions can be defined, which will show lean improvements in an objective way. Setting targets from the top management that are ill thought trough will be prejudicial because they will not have relevance and will send the wrong signal to the employees. A daily reporting in lean projects is essential in order to visualize continuous improvements.

9) **Communicate appropriately**

Set up an effective internal communication platform by using black boards or intranet, to provide information about the meaning of change to all employees. Displaying the steps and goals, which have been achieved so far, is important. Everyone can inform oneself about the lean implementation, which in turn enhances employees' commitment. Training is also a good form to inform employees.

10) **Be patient and resistant to throwbacks**

It often needs a few months or years to see the effects and impact of lean. Even though, short-term victories in the form of quick-wins are crucial to maintain passion, motivation and urgency, the management and lean managers need to be patient, think sustainable and

long-term. Schmidt (2017) also underlines the necessity to predict potential vulnerabilities of the introduction and how to deal with them. This helps resisting throwbacks.

Referring to Schmidt's ten critical success factors, he points out that in practice, especially quick-wins (no. 6) are important to show people straight from the beginning the positive impact of a lean culture. But, even though the overall goal of lean management is that employees internalize the philosophy and continuously living it in their daily work, in particular at the beginning, it needs drivers. Lean leaders need to take on the role as drivers and make sure that participants do not fall back to old habits until the culture is entirely implemented in the people's beliefs.

5. Practical application – Smart Engineering

After getting to know the theoretical background of change management at SMEs and aspects of a successful introduction of lean management as an effective answer to become an agile and self-learning organization, the second part of this paper deals with the practical application of change and lean management at an SME. Using this example, the author strives to illustrate why and how a change in a German engineering company was prepared and introduced and how it strived to become a dynamic and a continuous improving system through the execution of lean principles. Due to confidentiality reasons, the name of the company has been changed, hereafter Smart Engineering. The author of this paper was employed at the company in order to enable a smooth and successful organizational change at Smart Engineering by creating a cultural setting that would facilitate change and lean management. His tasks have been to support and be in charge for each step of the change ranging from analyzing the current situation in order to identify the drivers of change to carefully prepare a solid basis for change and lastly sensitively initiate and execute a new organizational culture enabling lean management. A consultancy, which is specialized in lean management, was hired to support the implementation of a lean culture. The author's role comprised to take close attention to people issues, by preparing and conducting surveys, interviews and workshops including both top managers and

employees within the company. Moreover, he has been in close collaboration with the consulting firm as a supportive function to facilitate the change.

5.1. Overview of Smart Engineering

Smart Engineering is a medium-sized and owner-managed business with about 220 employees. The family business, still managed by the first generation, operates globally with its headquarters in the south of Germany and three further subsidiaries located in Germany, USA and China. Since its foundation in 1987, Smart Engineering runs its business in the field of sheet metal processing by building complex machines for various customer groups, mainly in the automotive and HVAC[6] industry. To maintain the position as the market leader in a niche market, the machines are highly customized. Smart Engineering can be considered as a typical SME, as it meets the definition mentioned in the theory (see chapter 2).

5.2. Four steps of change management at Smart Engineering

Just like any other SME, Smart Engineering needs to deal with the omnipresent drivers of today's steadily changing environment, mentioned in chapter 1.2. Of particular importance are the challenges in digitalization and individualization of products and services. Besides, Smart Engineering operates in a niche market that is highly dynamic and faces the pressure from low-cost competitors from emerging markets. Also, technological enhancements lead to a steady rise in the complexity of the machines while customers expect low delivery times and a high degree of individualization. Thus, the business model and internal project management became more and more difficult over the years.

In the past, multiple attempts to change the organization and its culture failed - even with good intent and the support and consultation from external experts. Many reasons for failure can be mapped onto general characteristics that most often hamper SMEs in introducing and executing change (see chapter 2.1). This comprises that change projects at Smart Engineering have not been planned accurately and decisions were often made informal by the top management.

[6] Heating, Ventilation and Air Conditioning

Spontaneity and short-term thinking were in place, rather than creating a solid basis for change and having a clear strategy with specific, measurable milestones and goals. Besides, change initiatives were often triggered by the CEO, who is also the owner of the company, and his interests and beliefs instead of the observation of objective internal and external drivers. Past efforts also missed a clear focus and commitment from relevant persons within the organization since solving day-to-day problems was always of higher importance. The firm also considered change as a project that affects only particular departments, instead of creating a big picture where everyone in the company can find him- or herself and is asked to be a participating part. Since it is an engineering company, the management was mostly concerned about technical issues in production processes and, therefore, the focus lay mainly on operational changes. Soft aspects like leadership and organizational issues were of minor importance.

Even if the skepticism about the success and positive outcome of this planned change among employees was high, it became evident that Smart Engineering needs to transform itself to an agile and self-learning system in order to deal with the increasing complexity and to meet the customer requirements and, hence, ensure profitability in the long run. The change at Smart Engineering was planned and executed in four steps: analyzing the current situation, creating a solid basis for change, initiate change and pilot lean and, lastly, stabilize the new culture by planning future actions. Appendix 9 shows the temporal sequence of all four steps and comprised actions in a Gantt-chart.

5.2.1. Analyzing the current situation

As expressed by Anand and Barsoux (2017), many companies that aim to change oneself often put the focus solely on how to change by overlooking the question what needs to be changed. Smart Engineering's top management aimed to have a clear and common understanding of the current situation and the exact drivers that pressure the company for change. This was the very starting point for change and one key success factor (see chapter 2.2).

Some indicators that showed that the company struggled were easily observable. The company experienced a steady decrease in profits every year. Main reasons for that were pricing pressure and regular exceedance of delivery dates resulting in overlapping projects, financial penalties

and customers' dissatisfaction. Besides, the high fluctuation was also a sign for bad performance resulting in unsatisfied employees. In order to obtain an objective view from the employee's perspective the management decided to conduct a company-wide survey as well as individual interviews.

The survey results showed that basic requirements for a company's operation like innovative products, exciting projects and a good infrastructure were in place. However, the survey also expressed that the overall employee satisfaction was relatively low due to a number of reasons (see appendix 10). First, employees felt a certain degree of **disorientation**. The company's strategy for the next four years, which was announced several months before, was not clear. Employees did not understand the objectives and the communication process was considered as insufficient and too detailed and, hence, not comprehensible. Besides, employees felt **overload** in their work due to the lack of long-term and realistic planning by missing to take the available, scarce resources into consideration. Moreover, clear and stable **structures and processes** were missing in order to organize tasks across departments and to avoid duplications of work. One of the most critical points was the **lack of feeling of togetherness**. The survey pointed out that departments worked isolated and alongside rather than with each other. In general, the **communication** within Smart Engineering and in particular across departments was considered as poor, insufficient and sometimes also dishonest. Last but not least, employees mentioned that they oftentimes **felt being left alone** due to the fact that leaders did not take their role in guiding employees. In general, the leadership issue was one of the key problems. In the past, the family business experienced a large growth in size, but failed to adjust the structure and leadership accordingly and still operated as it were a small business.

5.2.2. Creating a solid basis for change

After having a holistic understanding about the firm's situation and the drivers that force the company to change, top management understood that it missed a solid basis whereupon a change can be built. But having clear overall goals and paths is important, so that employees are able to notice the direction where the company is heading to. Only then employees are able to understand, follow and participate in the change. Smart Engineering recognized proactively

that it needed to transform itself proactively, unlike many other SME's, who usually take the backseat (Tompkins, 2007). Referring to appendix 11 and chapter 2.2, an appealing vision and mission, a clear strategy as well as a strong value system with the appropriate leadership style build the fundament for change. As it became evident that these were missing, they first had to be developed. In order to accomplish this, several workshops with the top management were conducted. Due to confidentiality reasons the following aspects should give only an overview and, hence, are not presented in detail.

Vision

A vision serves as an aspirational description of where an organization wants to head to and what it would like to achieve in the mid- or long-term future. Hence, a vision is a desired future position of the company and intends to be a clear guide for choosing current and future actions. The latest version of Smart Engineering was dated back to 1992 and had never been updated. During the workshop, the fundamental question was answered: What and who wants Smart Engineering to be in the future? The new vision encompassed both internal and external perspectives including all stakeholders - customers, employees, owners und society[7].

Mission

In contrast to the vision, a mission statement is important for explaining how the company wants to pursue and realize the vision. A mission is something to be accomplished whereas a vision is to be pursued for that accomplishment. Hence, the mission focuses on the company's present state rather than on the future. Smart Engineering never developed a mission statement. This is quite typical for SMEs that focus more on short-term and day-to-day tasks. The mission statement, developed in a workshop with C-level managers, gave an answer to the question: What can we do to realize the vision? The new mission encompassed four elements: product, market, digital transition and employees (see appendix 13). The top management put a sharp focus on the challenges and opportunities of digitalization and how they could benefit from it.

[7] For further information about the development, please see appendix 12

Strategy until 2020

A strategy is a roadmap or high-level plan that aims to achieve long-term objectives under conditions of uncertainty in the future and, hence, supports the vision and mission. Having a profound understanding about the organization's current situation as well as the competitive environment is fundamental. At the beginning of 2017, almost one year before the start of the change project, the management of Smart Engineering developed a company-wide strategy for the next four years until 2020. Even if the strategy was well thought, the top management missed to create a big picture by bringing details and individual goals together. Consequently, employees did not understand the strategy, its message and goals. It was not obvious that everyone is pulling in the same direction towards a common goal. Thus, the aim of the strategy workshop was not to modify the good thoughts and objectives made several months ago, but to bring all threads together in one holistic strategy, which is communicable and comprehensible.

Culture and values

As mentioned in the theoretical part of this paper, many researchers advise to emphasize also soft aspects of change management and point out that change management always implicates culture management (see chapter 2.2). The culture of Smart Engineering was mainly characterized by the founder, who is at the same time owner and CEO. The main actions and decisions made within the family business were still centralized at him. Even if the business had two other managers at C-level, employees considered at any time the owner as their boss. It is always hard to break the strong ties, power and charisma of a firm's founder, but in times of change it is even more essential that the organization has supporters and change agents among employees who push the transformation, as explained in chapter 2.2. The lack of leadership abilities among leaders at Smart Engineering, figured out through the survey, was not the only evidence for a strong owner-management at the SME. But, in order to become a quickly mutable and improving organization, it needs strong leaders that inspire and motivate their followers. At Smart Engineering where employees accomplished tasks without having much decision-making power and responsibility, it was crucial to develop a cultural setting that facilitated self-learning and empowered employees. Giving them the right to decide and to take

responsibility for their tasks was vital. As illustrated in appendix 14, the firm developed the new culture in five stages. First, workshops with the C-level and, afterwards, with employees from different departments were conducted in order to identify the existing culture. Based on that, the company's identity, displayed as the deep values that made the company strong in the past, were enriched by behavioural patterns that were considered as important for the company's future. This resulted in a broad range of behaviours which were summarized and clustered in nine values (see also appendix 15). As successful change initiatives of other companies prove, it is critical to first start in small-scale to not to overwhelm the organization, especially as resources at SME's are scarce (see chapter 2.1 and 2.2). Consequently, in another workshop, top management agreed on four of the nine values, displayed in appendix 16, that were most important for initiating cultural change in the first place. Only these were communicated by the C-level to the entire organization. But deciding on the values was not enough. It was important that the top managers who serve as role models, had a clear and common understanding of each value. Thus, the C-level precisely described in a workshop (step 4) each value and defined the exact meaning, key behaviour patterns and supporting measures. Further measures like collaboration activities to initiate and facilitate living these values within the organization were then selected in a last workshop (step 5) with the HR department as a supportive department.

5.2.3. Initiating change and piloting lean

After having built the fundament for change, the next step was initiating the change. How do we want to execute change and what is the right type that fits best to the business model? Even though the business is of technical nature, it was always the people and their great knowledge and skills that built the sophisticated products. Thus, the top managers realized that the human factor is of great importance but was always underestimated. The change initiative, therefore, should have had the right balance between structuring the organization while putting great focus on soft aspects like leadership topics (see chapter 3.2). Establishing a clear structure and accurate processes was important to enable a smoother work while reducing costs, wastes and

duplications of work lowering the overall workload. But, living the new culture was at least as critical in order to develop strong leaders and an appropriate leadership style.

The top management was of the opinion that the lean philosophy gave the right answer to the highly customer-oriented company in order to become more profitable while offering individualized, technologically sophisticated products for various customers. Self-learning employees who continuously strive for improvements are key to become agile and quickly responding to the market and to customer requirements.

A consultancy specialized in lean management was hired in order to support the introduction of the lean culture. The C-level decided to pilot lean on the shop floor, since it was considered as most suitable due to a number of reasons which are also key success factors of introducing lean (see chapter 4.2). Firstly, production was the key department and the heart of value creation at the company. Furthermore, processes on the shop floor enabled small and easy changes that had great impact and, finally, showed direct observable quick-wins like reduction of processing times. This reduced employees' skepticism and resistance for change from past failures. Moreover, many people worked in the production department so that the pilot involved a large group. All in all, the production department was estimated as the optimal starting point from where lean should have been instilled in the company's culture initially to grow slowly. One employee, who was considered most appropriate, was chosen as the lean manager who was responsible for pushing the lean philosophy. He was also expected to be in charge for future roll-outs of lean initiatives. Some other employees, defined as lean agents, should support the lean manager in motivating other employees for change. Everyone who was affected by the pilot project was involved from the very beginning through workshops.

5.2.4. Planning future actions for executing change

At the time this paper was written, Smart Engineering was still in the beginning of the lean management pilot. But nonetheless, even if starting small is important, as learned in theory, further steps of the roll-out should be planned ahead of time. Hence, actions that facilitate the change, lean thinking and continuous improvement across the entire company were defined.

Organizational structure

The top management developed, together with the consultancy, a new organizational structure that facilitates faster responses to changing conditions. The former line organization is going to be replaced by a matrix organization that allows a high degree of interactions and less hierarchy.

Leadership development

To strengthen leaders in their position and to encourage the living of the new culture and its four core values, trainings and workshops should be offered. Furthermore, Management by Objectives is planned to be the new form of leadership style to the effect that, leaders get realistic and measurable goals and are responsible to fulfill these autonomously together with their employees. Their behavior according to the new values will also be evaluated.

Lean management in supporting departments

The introduction of lean management in the future should not only encompass primary departments that create direct value to the firm, but also supporting departments like IT, HR, Finance among others. Therefore, the lean campaign needs to go beyond the key departments. Common guidelines that show employees how to work "lean" in their department and in collaboration across departments are going to be developed. A first measure was the introduction of guidelines for a lean meeting (see appendix 17).

Team work and spirit

As the survey revealed, the feeling of togetherness at Smart Engineering was relatively low. To counteract this, the top management aims to facilitate team work and to enhance communication. A first measure was the implementation of a new culture. But, the infrastructure needs to foster the culture as well. Collaborative workspace, where employees can meet to have quick informal meetings rather than communicate only via E-Mail or phone are in the planning stage. Moreover, various team building measures are intended.

6. Discussion

This practical example represents how a German medium-sized engineering company prepared itself for change and introduced lean management. The purpose of this section is to critically

reflect the procedure and outcomes of the change that the company has taken so far in order to learn for future actions and to adjust the everlasting change at the company (see appendix 18). First of all, it needs to be pointed out that the entire change was planned well ahead of time, well-thought and accurately, unlike previous attempts for change. The development of the vision, mission, strategy and value system was fundamental to the company. This showed also that the priority for change was high and the top management was willing and committed. Besides, it was absolutely necessary to bring details together by developing an appealing big picture that motivates and inspires the people for change. Additionally, the overall reluctance for change and the skepticism about external support from a consultancy have been eliminated successfully. It was of particular importance that employees perceived the external consultants as down-to-earth and relevant for the change. Consequently, the external partner was accepted and acknowledged by the organization. Moreover, the top management decided wisely to involve a large group of employees in the change process, for instance in the culture development, as well as in the lean management pilot. But at the same time, management has understood that starting on a small scale through a pilot was important to create quick-wins and to convince critics. Last but not least, the more frequent and open communication can be considered as positive, as it led to a decrease in employees' disorientation and, simultaneously, to a rise in their entrepreneurial thinking and commitment towards change.

However, in order to learn for the future, it is essential to question oneself, what could have been done better? Firstly, change experts suggest that one should be clear what exactly to change before deciding on how (see chapter 2.2). Even if Smart Engineering was aware of analyzing the current situation to picture the drivers for change, the external stakeholders' view such as from suppliers or customers were missed. The company focused mainly on internal views to define the status quo since it thought that it knew the customers' and suppliers' needs without involving them. Also, the strong and continuous focus on the day-to-day business as well as on technological issues has never been eliminated completely, which hampered the execution for change. The fact that the lean pilot took place in the production department can be seen as appropriate, due to a number of reasons mentioned above. But on the other side, one

could argue that the management did not overcome their engineering-driven attitude by piloting in non-technological, supporting departments as a clear signal that they are equally important. One of the main problems that made the change particularly difficult was the lack of solidarity and common understanding as well as problems in relationships and coordination of the top management. Employees never recognized the C-level as one entity that pull in the same direction. Besides that, personal issues and disputes between two members of the C-level effected the entire organization. As a consequence, one top manager was dismissed during the change. Those issues caused that the company's change process jumped back- and forward across steps. For instance, the new organizational structure, considered by the top management as eminently important for enabling self-learning and agility, was developed but not introduced since there existed different viewpoints based on lack of trust between top managers. Another reason that significantly interfered with the change was the centralization at the founder. Even if his power and charisma could be reduced, employees still felt attached with the founders' person. A key learning here is, never to underestimate the role and strong ties of the owner and founder of a family business and rather make use of it instead of trying to break it up what often leads to adverse effects. In addition to that, Smart Engineering strived to provide an open, honest communication on a frequent basis. However, too much information, especially critical and negative ones, lead to a higher degree of uncertainty and anxiety among employees. It is important to find the right balance between timely and honest communication while keeping secrets to not irritate the organization. Moreover, best practice visits were only organized for the C-level in order to decide if lean management is the appropriate method. However, building a network with other companies and exchanging ideas and learnings is essential for a successful lean implementation. Lastly, even if employees were involved in lean workshops to figure out improvements in their own work, specific trainings about the background and principles of the lean philosophy were missed to increase the understanding and acceptance for it.

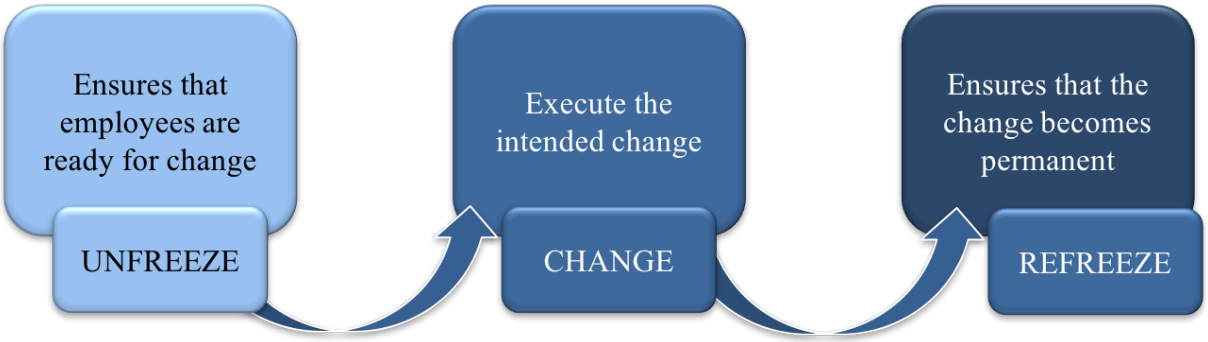
7. Personal reflection and conclusion

Even though, preparing and planning change and lean initiatives are of great importance, one should keep in mind that even the best and well-thought plans are not sufficient. The reality is always more difficult and complex than assumed. Hence, always think about alternatives and be spontaneous and flexible enough to adapt your plan according to the changing and unforeseen circumstances without throwing away your initial strategy. Do not underestimate the power of relationships and the mindset and habits of the people within the organization. Especially in family firms, where the owner is often times the founder and manager at the same time, and where personal issues play a much greater role – both negatively and positively. Besides, even if the theory emphasizes that employees need to be convinced, the practice shows that this is not enough and it still needs drivers that pushes the change. Since people are mostly resistant to break their routine, a change leader team has to force them constantly till the point the new way becomes routine again. Moreover, the theory points out the high significance of communication during a change. The practice, however, shows that too much information can lead to needlessly uncertainty and anxiety among employees. But there is not one right way, rather the top management needs to have a sense for the appropriate balance in their communication process. At least as important is the unity and determination of the top management by having a common and clear direction they are steering towards. Additionally, be aware that changing an organization takes time, discipline and great effort. Think about incremental changes and do not expect too much in too little time.

To come to a conclusion, the theory of change and lean management provides many good hints and approaches for introducing both concepts. And even if their key success factors overlap, do not mix up the concepts of change and lean management, rather consider lean as a culture and method to be able to react flexible to quick changes. But at the end, when introducing change, SMEs have to consider their restrictions like scarce resources and at the same time, need to overcome their own boundaries like their daily-solving approach in order to become an agile and self-learning organization. Last but not least, keep in mind that the planning is always relatively easy. The execution, by contrast, is much more difficult, especially at changing times.

Appendices

Appendix 1: *Three-Step-Model* by Lewin



Source: Lewin, K., 1951. *Field theory in social science*. New York: Harper & Row.

Appendix 2: *Eight-Steps-to-Successful-Change* by Kotter

Source: Worley, C.G. and Mohrman, S.A., 2014. *Is change management obsolete?* Organizational Dynamics Vol. 43.

Appendix 3: Overview of traditional change models

Lewin (1951)	Bullock and Batten (1985)	Kolb and Frohmann (1970)	Whetten and Cameron (2005)
Unfreeze	Exploration	Scouting	Establishing a climate of positivity
		Entry	
Change	Planning	Diagnosis	Creating readiness for change
		Planning	
	Action	Action	Articulating a vision of abundance
			Generating commitment
Refreeze	Integration	Evaluation	Institutionalizing the positive change
		Termination	

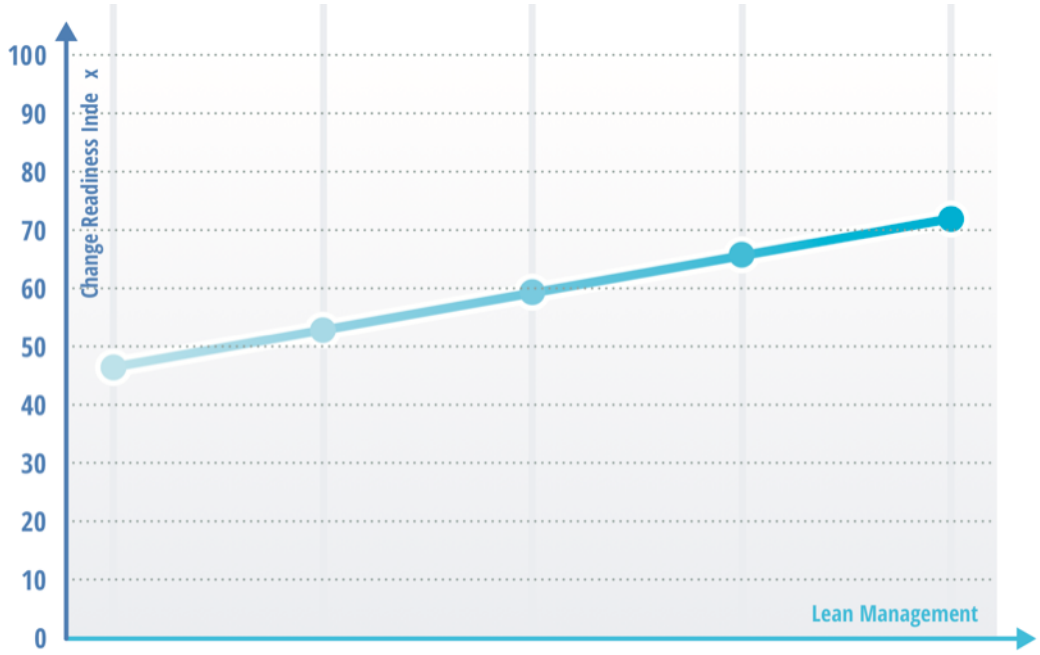
Source: Kang, S., 2015. *Change Management: Term confusion and new classifications.* International Society for Performance Improvement, 54 (3).

Appendix 4: *Engage-and-Learn-Model* by Worley and Mohrman

Awareness includes that the organization members need to be aware of the issues and challenges they are facing. *Design* focuses on shaping the behavior of the members and sets coordination and collaboration standards. *Tailor* means that implementation processes need to be highly individualized to the organization's unique, valuable and difficult to replicate resources rather than a standardized "cut and pasted". Lastly, *Monitor*ing involves understanding the impact of the organizational change, the development of the desired outcome as well as recognizing the progress in achieving the goals by making rapid adjustments based on the day-to-day learnings. This is critical to detect errors and learn from it frequently. In the center of the model, the two motivations *engagement* and *learning* are key to link the people throughout the organization and make the change happen.

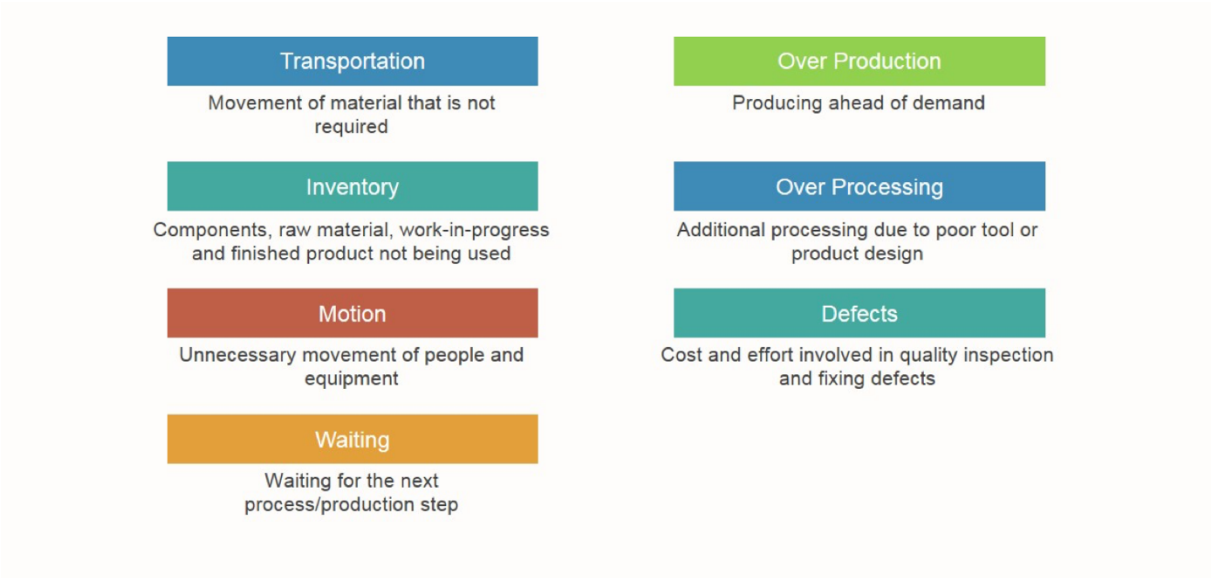
Source: Worley, C.G. and Mohrman, S.A., 2014. *Is change management obsolete?* Organizational Dynamics Vol. 43.

Appendix 5: Change Readiness Index (Organization's readiness increases with lean management initiatives)



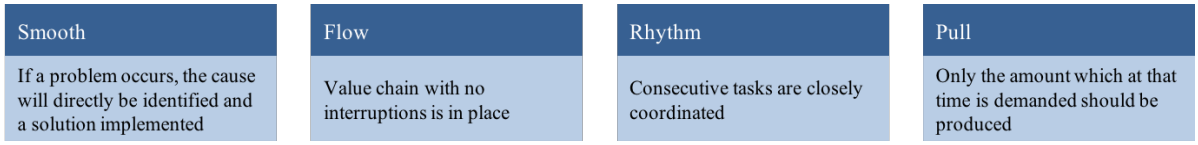
Source: Staufen AG, 2017. Studie: *Erfolg im Wandel- Deutscher Change Readiness Index 2017*. http://www.staufen.ag/fileadmin/HQ/02-Company/05-Media/2-Studies/STAUFEN.-studie-erfolg-im-wandel-2017-de_DE.pdf

Appendix 6: Seven Types of waste in lean management



Source: Lean Enterprise Institute, 2017. *What is Lean?* https://www.lean.org/WhatsLean/

Appendix 7: Four principles of process excellence in lean management



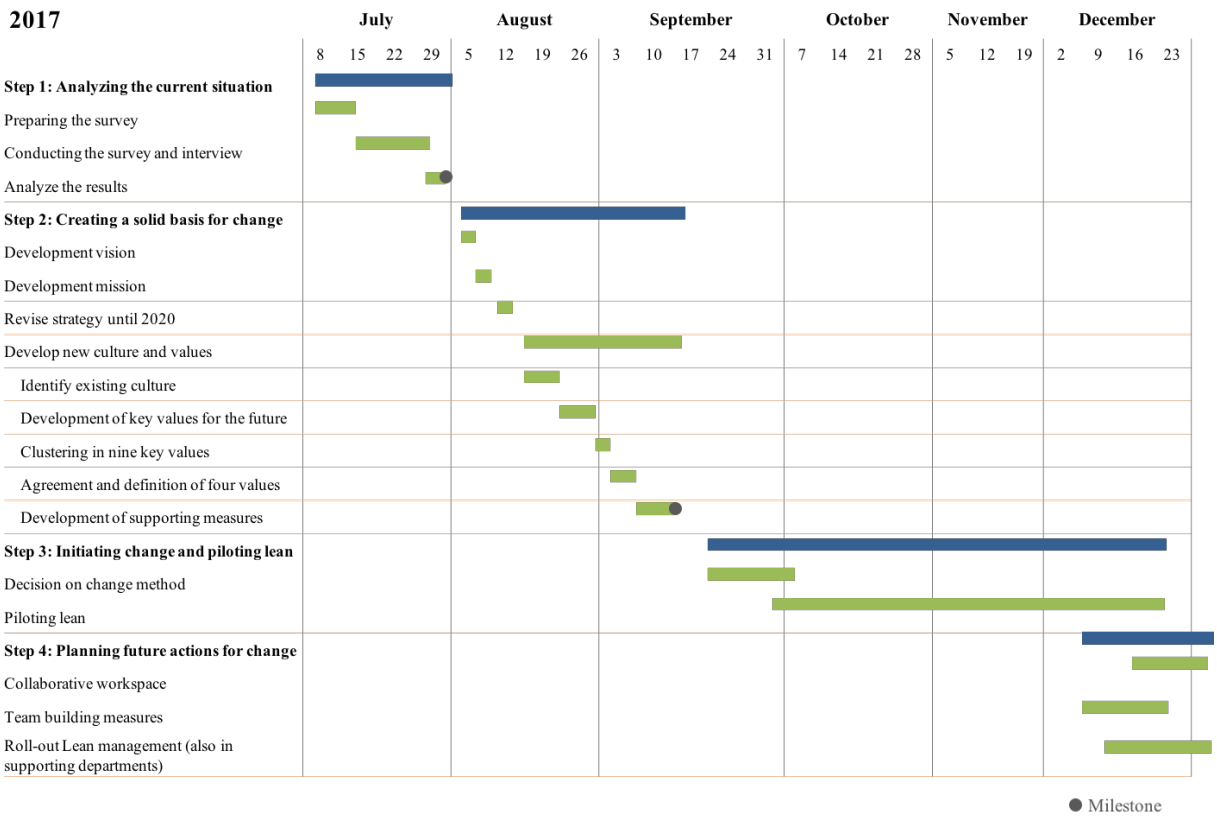
Source: Staufen AG, 2016. *Lean Leadership. Mit Führung zur Spitzenleistung*. http://www.staufen.ag/fileadmin/HQ/02-Company/05-Media/2-Studies/STAUFEN.-whitepaper-lean-leadership-2016-de_DE.pdf

Appendix 8: Comparison of key success factors of change and lean management

KSF change management	KSF lean management
Follow a proactive approach (vision mission, strategy, etc)	Have a clear understanding
Include employees from different levels and functions	Involve everyone
Everyone should become a change agent	Establish a leader team
Emphasize soft aspects such as cultural, organizational and human topics; cultural and change management are interrelated	Train employees
Plan and prepare appropriate with long-term and strategic view	Plan long-term and careful
Pilot change, create quick-wins	Start small and getting bigger
	Networking and learning from others
Prioritize change projects	Define objectively measurable and specific criteria
Change needs to be communicable to all participants; Communication needs to be balanced	Communicate appropriately
Create resilience	Be patient and resistant to throwbacks

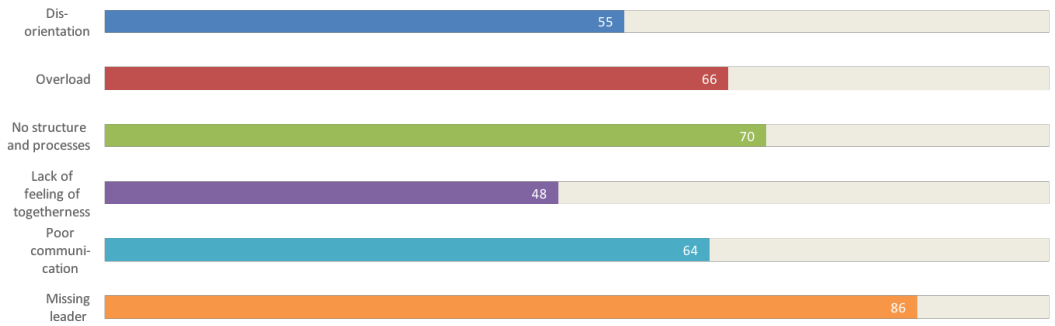
Source: Author

Appendix 9: Temporal sequence of all steps of introducing change at Smart Engineering



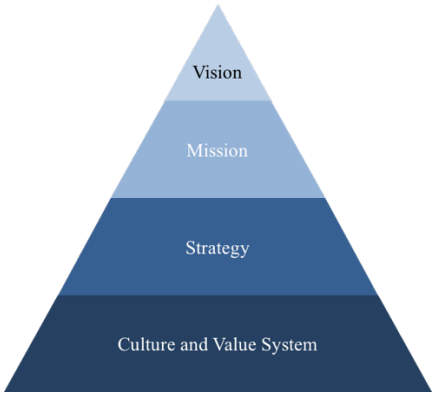
Source: Internal document of Smart Engineering

Appendix 10: Results of the company-wide survey at Smart Engineering



Source: Internal document of Smart Engineering

Appendix 11: Fundament for change



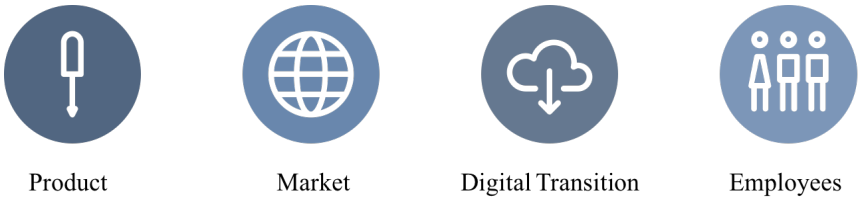
Source: Tompkins, J.A., 2007. *4 Steps to business resilience*. Industrial Management, 49 (4).

Appendix 12: Vision development at Smart Engineering

The top management of Smart Engineering took the view that the new vision should address in particular internal factors to reinforce the willingness and need for change. The vision needed to guide strategic issues, especially during this time of significant change. Besides that, inspiring employees together with guiding them in their decision making and behavior were of great importance to the top managers. All in all, during the development phase, it was critical that the new vision on the one hand displayed the company's identity and on the other hand also emphasized the importance for change. Keeping in mind that it serves for a long time and not only for the time of change was also vital.

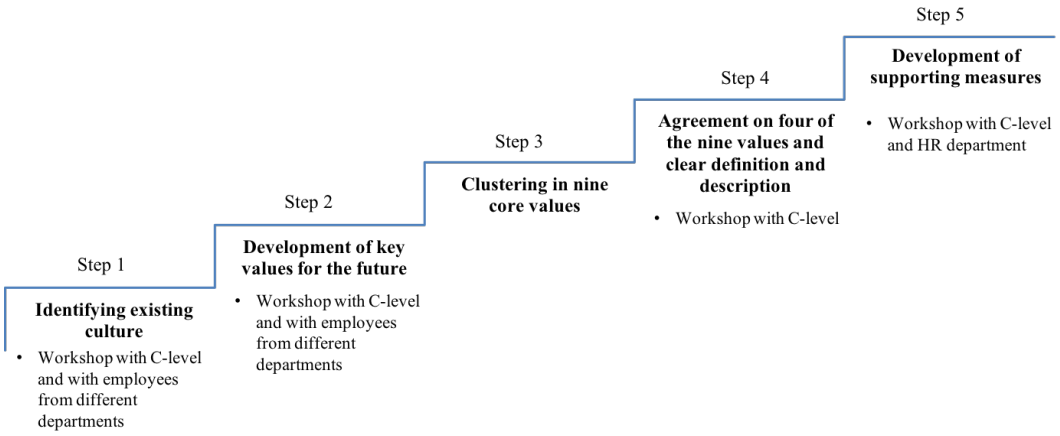
Source: Internal document of Smart Engineering

Appendix 13: Components of Smart Engineering's new mission



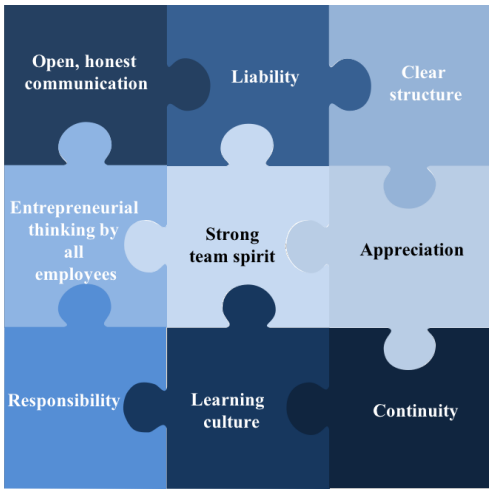
Source: Internal document of Smart Engineering

Appendix 14: Five steps of developing the new culture at Smart Engineering



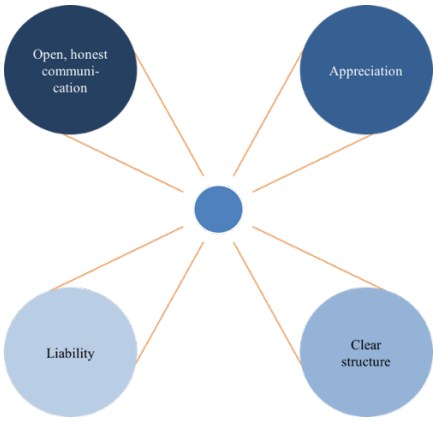
Source: Internal document of Smart Engineering

Appendix 15: Cluster of nine values at Smart Engineering



Source: Internal document of Smart Engineering

Appendix 16: Four core values for initiating cultural change at Smart Engineering



Source: Internal document of Smart Engineering

Appendix 17: Guidelines for a lean meeting at Smart Engineering

Source: Internal document of Smart Engineering

Appendix 18: Critical reflection of change management at Smart Engineering

Good	Bad
Well-thought and accurate planning ahead of time	No involvement of external stakeholders in analyzing the current situation
Creating the fundament for change: detailed and structured development of vision, mission, strategy and value system	Day-to-day business and the everlasting focus on the hard technological aspects still hampered the execution of change
Creating an appealing big picture	C-level issues like problems in coordination, common thinking, relationship problems etc. interfered with the change
External support was perceived as helpful, employees acknowledge them	Jumping back and forward across the steps of change
Involvement of a large group of employees in the change and lean management pilot through workshops	Centralization at the owner/founder
Frequent, open and transparent communication	Sometimes too much information and communication led to uncertainty and anxiety
Piloting on small scale	Best practice visits only on C-level, missing to network with other companies in order to exchange learnings
	No specific lean trainings for employees

Source: Author

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